Space Weather Forecast

Issued on Sunday, 03 April 2022 at 01:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: S1/Minor radiation storm declining to background. Slowly declining risk of further M-flares. Chance of G1/Minor Storm on Day 1 (03 Apr).
Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate in the past 24 hours, with three Moderate-class flares, all from the region near the northwest limb where three sunspots are close together. There are now seven sunspot regions on the facing side of the sun, with the most active being the combination of three sunspot regions near the northwest limb. Elsewhere on the disc, two large spots near south centre disc showed some minor growth through the period. The remaining regions are small and simple, but there is a new region rotating onto the southeast limb which cannot yet be classified.
The long period Moderate-class flare which peaked around 02/1400 UTC gave a Coronal Mass Ejection (CME), but this is considered unlikely to have an Earth-directed component. No other Earth-directed CMEs have been seen in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind showed a likely CME arrival at 02/0020 UTC, this probably combined with a fast wind from a coronal hole. The wind speed was initially around 490km/s, but jumped to vary between 530-590 km/s at 02/0020 UTC, before settling between 510-540 km/s. The Interplanetary Magnetic Field was mainly weak but reached moderate levels between 02/0030-0300 UTC. The north-south component varied moderately at first, settling mainly weakly southward directed after 02/0300 UTC. Geomagnetic activity was Quiet to Active (Kp 2-4), with a G1/Minor Storm (Kp5) interval between 02/0300-0600 UTC.

Energetic Particles / Solar Radiation: The solar radiation levels reached S1/Minor Storm levels at 02/1430 UTC, after a Moderate-class flare from the northwestern limb region. Solar radiation levels have since declined, and are now around the S1 threshold.
Four-Day Space Weather Forecast Summary
Solar Activity: Further Moderate activity is likely through this period with a slight chance of High activity. The risk reduces through the coming four days as the regions near the northwest limb rotate off the visible disc.

Solar Wind / Geomagnetic Activity: Earth is likely experiencing a CME influence, probably combined with some fast wind influence from a coronal hole. It seems likely that the associated elevated solar wind conditions will continue through much of Day 1 (03 Apr), before gradually easing into Day 2 (04 Apr). No further CME or coronal hole effects are currently expected through Days 3 and 4 (05-06 Apr), with solar winds forecast to be close to ambient levels. Geomagnetic activity is expected to be Quiet to Active (Kp 2-4) with a chance of G1/Minor Storm (Kp 5) intervals through Day 1, easing through Day 2, to become mostly Quiet through Days 3 and 4.

Energetic Particles / Solar Radiation: The solar radiation levels are currently around the S1/Minor Storm threshold after an earlier long period Moderate-class flare. This is expected to gradually decline to background levels during Day 1 (03 Apr). The risk of further radiation storms will slowly reduce as the northwestern sunspot regions rotate well off the disc.
Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	50	40	40
Very Active	R3 to R5 X	No	10	10	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	80	15	10	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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